

In re application of DUJARI
Serial No. 09/703,381

REMARKS

The Office action has been carefully considered. In the Office action, claims 37-52 and 68-72 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,230,200 to Forecast et al. ("Forecast") in view of U.S. Patent No. 6,230,200 B1 to Smith et al. ("Smith"). Applicant respectfully disagrees.

By present amendment, claims 37 and 68 have been amended for clarification and not in view of the prior art. Applicants submit that the claims as filed were patentable over the prior art of record, and that the amendments herein are for purposes of clarifying the claims and/or for expediting allowance of the claims and not for reasons related to patentability. Reconsideration is respectfully requested.

Applicants thank the Examiner for the interview held (by telephone) on June 9, 2006. During the interview, the Examiner and applicants' attorney discussed the claims with respect to the prior art. The essence of applicants' position is incorporated in the remarks below.

Prior to discussing reasons why applicant believes that the claims in this application are clearly allowable in view of the teachings of the cited and applied references, a brief description of the present invention is presented.

The present invention is directed, generally, to a system and method for enhancing security and file system performance, by preventing malicious activity through use of randomly named cache directories and by automatically balancing

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files among the randomly-named subdirectories that have content cached therein.

As is known, some malicious content that may inadvertently be accessed by a user can invoke malicious code stored on the user's file system. To do this, the malicious content relies on predictably knowing the file system path to the cached malicious file that is to be invoked. By having randomly-named cache directories, such malicious content cannot correctly reference any files stored in the cache directories, because the path is not known or knowable to the malicious content. To this end, in one example embodiment, random subdirectory names are generated and used to name cache directories, such that when a randomly-named cache directory stores an associated file, the path to that file includes the random subdirectory name. As a practical result, a file cannot be invoked by malicious content, even when the file otherwise has a predictable filename.

At the same time, certain file systems may experience degraded performance when more than a certain number of files are in the same directory. The balancing mechanism of the present invention operates to avoid such degraded performance. In one example, the balancing mechanism is able to track the number of files in each directory (and subsequent uniquely-associated and also randomly-named cache directory) and may determine whether one or more cache directories need to be created. If so, the balancing mechanism determines how many directories to create and creates that many directories.

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Further, as new files are added, the balancing mechanism may distribute the files among the various randomly-named and uniquely-associated directories, e.g., based on the directory that has the least number of files. If the number of files in the selected directory plus the number to be stored exceeds a predetermined threshold amount, then more of these directories may be created. If no more directories may be created, e.g., due to an imposed or practical limit, then files may be removed from existing directories (such as those which have not been accessed for the longest time).

Note that the above description is for general informational purposes only, and is in no way intended to limit the claims, which are discussed below.

Turning to the claims, amended claim 37 is generally directed towards generating random subdirectory names for naming randomly-named cache directories that are created. By storing files under the randomly-named cache directories, any such file includes a random name in its path, whereby it cannot be (at least not realistically) invoked by malicious content to execute, including when the file has a predictable filename. Automatic balancing the files among the randomly-named cache directories is also recited.

The Office action rejected claim 37 as being unpatentable over Forecast in view of Smith. More specifically, the Office action contends that Forecast teaches generating a plurality of subdirectory names, wherein each subdirectory name is random. Column 8, lines 26-30 of Forecast is referenced. Further, the Office action contends that Forecast teaches creating a plurality of randomly-named cache directories, one for each random subdirectory name generated.

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Column 67, lines 40-47 of Forecast is referenced. Still further, the Office action contends that Forecast teaches storing a plurality of files under the plurality of randomly-named cache directories, each of the plurality of files having a predictable filename. Column 2, lines 14-16 of Forecast is referenced. Finally, the Office action contends that Forecast teaches automatically balancing the files among each of the plurality of randomly-named cache directories. Column 67, lines 40-47 of Forecast is referenced.

The Office action concedes that Forecast does not teach creating a plurality of randomly-named cache directories, one for each random subdirectory name generated, such that each randomly-named cache directory created is uniquely associated with a corresponding randomly-named subdirectory. However, the Office action contends that Smith does teach this limitation and references column 2, lines 14-35 thereof. The Office action concludes that it would have been obvious to a person skilled in the art at the time the invention was made to combine the teachings of Forecast with the teachings of Smith to arrive at the recitations of claim 37 because optimal performance would be realized by caching information in the manner suggested. Applicant respectfully disagrees.

To establish *prima facie* obviousness of a claimed invention, all of the recited claim limitations must be taught or suggested by the prior art; (*In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)), and "all words in a claim must be considered in judging the patentability of that claim against the prior art;" (*In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970)). Further,

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if prior art, in any material respect teaches away from the claimed invention, the art cannot be used to support an obviousness rejection. *In re Geisler*, 116 F.3d 1465, 1471, 43 USPQ2d 1362, 1366 (Fed Cir. 1997). Moreover, if a modification would render a reference unsatisfactory for its intended purpose, the suggested modification / combination is impermissible. See MPEP § 2143.01.

Applicant submits (as has been submitted in previous Office action responses) that the Office action has failed to establish a *prima facie* case for obviousness. All of the recited claim limitations of claim 37 have not been shown to be taught by the prior art of record. In general, claim 37 recites storing files under the plurality of randomly-named cache directories such that a stored file includes a random name in its path and cannot be invoked by malicious content to execute. Thus, as files are cached, they are stored in randomly named subdirectories that correspond to cache directories. Malicious content cannot guess how to invoke a file, even when the file has a predictable filename.

Forecast simply does not teach this concept of randomly-named subdirectories corresponding to randomly-named cache directories as correctly acknowledged by the Office action. Smith does not cure this deficiency either. Smith is directed, generally, to a method for accessing and updating information stored in a library of information. More particularly, the section cited by the Office action describes a method that includes using a cataloguing step having a unique contents-based value for each of the catalogued discs, such that the unique value is produced by iteratively reading data from a target disc. With this protocol in place, data streams may be transmitted that include all information to

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be transferred including subdirectory structures, directory names, variable file lengths and the like.

The unique identifier of Forecast, however, does not obfuscate the files stored within the disc associated with the unique identifier. There is no mention, in any manner, of a goal or desire to prevent malicious activity from occurring. Both Smith and Forecast are silent with respect to anticipating or otherwise dealing with malicious activity, much less preventing malicious content from accessing files stored in a cache.

Further, the Office action essentially admits that Forecast does not teach the limitation (or even the concept) of generating the subdirectory names or creating the plurality of cache directories and naming them according to the subdirectory names. Smith does not cure this deficiency, despite the Office action's erroneous interpretation of Smith. In Smith, it is the value assigned to each disc that is the unique contents-based subject matter. Thus, unique (not random) values are associated with discs that may contain data in directories and subdirectories, and when this information is needed, it is transferred based upon an identification system that uses a unique value per disc for identification and data streaming. This is quite different from the subject matter recited in claim 37.

Moreover, applicant submits that Forecast is non-analogous art to the present invention. As has been set forth before, Forecast teaches, generally, a system and method for allocating component resources when streaming data from a video file server. Significantly, Forecast does not describe balancing files

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among directories, let alone balancing among cache directories that have a specific relationship to a randomly named sub-directory, as recited in claim 37. Nor does Forecast describe distributing new files that are added among the various directories, as described in other dependent claims. Not even by analogy does such an enormous leap in logic reach the claims of the present invention. In fact, to the extent that forecast deals with storage, Forecast actually teaches away from applicant's invention, by allocating across all disks within a volume set to increase capacity, suggesting that load balancing of video content may be accomplished by exporting multiple file systems (and not by dealing with files and/or directories within a file system volume). For at least the foregoing reasons, applicant submits that claim 37 is allowable over the prior art of record.

Applicant respectfully submits that dependent claims 38-52, by similar analysis, are allowable. Each of these claims depends either directly or indirectly from claim 37 and consequently includes the limitations of independent claim 37. As discussed above, Forecast and Smith, whether considered individually or in any permissible combination at law, fail to teach or suggest the recitations of claim 37 and therefore these claims are also allowable over the prior art of record. In addition to the recitations of claim 37 noted above, each of these dependent claims includes additional patentable elements.

For example, claim 51 generally recites maintaining a file count of a number of files stored in each of the plurality of randomly-named cache directories, and wherein automatically balancing files among each of the plurality of randomly-named cache directories includes moving at least one file out of one

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of the plurality of randomly-named cache directories to avoid degraded performance when the file count maintained therefor achieves a threshold value. As discussed above, neither Forecast nor Smith teaches automatically balancing files among each of the plurality of randomly-named cache directories. Thus, Forecast cannot possibly be construed to teach "moving at least one file out ... to avoid degraded performance when the file count ... achieves a threshold value," as plainly recited in claim 51. The only "limits" mentioned by Forecast are regarding the allocation of a video stream file, based on the capacity of a particular resource. A particular resource in Forecast may be limited by any number of factors, including load demand, processor speed, etc., but certainly there is no teaching or suggestion regarding some capacity based on a number of files that may be associated with the particular resource. Moreover, claim 51 is directed to performance, not capacity; (file system performance degrades if a directory has too many files, even though that directory still has the capacity to contain many more files). Applicant submits that claim 51 is allowable for at least this additional reason.

Turning to the next independent claim, amended claim 68 is generally directed towards automatically balancing files for performance reasons, i.e., such that a count associated with the number of files in any directory remains below a threshold count. Neither Forecast nor Smith teaches or even suggests this limitation, in any manner. Similar to claim 51, claim 68 is directed to balancing for performance reasons, not capacity; (in contemporary file systems, performance can degrade based on the number of files in a directory, well before

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capacity can possibly become an issue). For at least the foregoing reasons, applicants submit that claim 68 is allowable over the prior art of record.

Applicant respectfully submits that dependent claims 69-72, by similar analysis, are allowable. Each of these claims depends either directly or indirectly from claim 68 and consequently includes the limitations of independent claim 68. As discussed above, Forecast and Smith, whether considered individually or in any permissible combination at law, fail to teach or suggest the recitations of claim 68 and therefore these claims are also allowable over the prior art of record. In addition to the recitations of claim 68 noted above, each of these dependent claims includes additional patentable elements.

Applicant submits that all the claims are patentable over the prior art of record for at least the foregoing reasons. Reconsideration and withdrawal of the rejections in the Office action is respectfully requested and timely allowance of this application is earnestly solicited.

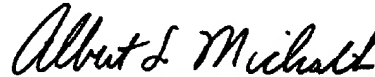
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CONCLUSION

In view of the foregoing remarks, it is respectfully submitted that claims 37-52 and 68-72 are patentable over the prior art of record, and that the application is in good and proper form for allowance. A favorable action on the part of the Examiner is earnestly solicited.

If in the opinion of the Examiner a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney at (425) 836-3030.

Respectfully submitted,



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I hereby certify that this Amendment, transmittal and facsimile cover sheet, are being transmitted by facsimile to the United States Patent and Trademark Office in accordance with 37 C.F.R. 1.6(d) on the date shown below:

Date: July 21, 2006


Albert S. Michalik

1411 6th Amendment